

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A millimeter wave transmitter for performing millimeter wave radio transmission indoors, comprising:
 - a connection unit connectable with an antenna receiving a plurality of broadcasting waves;
 - a power supply circuit supplying driving power to said antenna through said connection unit;
 - a broadcasting wave input circuit receiving said plurality of broadcasting waves through said connection unit and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;
 - a broadcasting wave modulation circuit up-converting said broadcasting signals to millimeter waves to be transmitted/received indoors;
 - a millimeter wave transmission circuit transmitting said millimeter waves; and
 - a frequency arranging circuit temporarily converting a radio frequency band of terrestrial waves below a frequency band of other of said broadcasting signals to an intermediate frequency band above said other broadcasting signals, thereby changing the frequency arrangement of said broadcasting signals.
2. (Original) The millimeter wave transmitter according to claim 1, wherein said millimeter waves are radio waves of the 60 GHz band.

3. (Original) The millimeter wave transmitter according to claim 1, wherein said broadcasting waves include at least one of radio waves of the radio frequency band of terrestrial waves and radio waves of an intermediate frequency band of satellite broadcasting.

4. (Canceled)

5. (Original) The millimeter wave transmitter according to claim 1, further comprising:

a video/audio signal processing circuit producing at least one of a video signal and an audio signal on the basis of internal information of said millimeter wave transmitter,

a modulation circuit modulating said signal produced by said video/audio signal processing circuit to a broadcasting wave receivable in an electronic apparatus having a function of receiving broadcasting, and

a mixing circuit mixing an output wave from said modulation circuit with said broadcasting waves input through said connection unit.

6. (Original) The millimeter wave transmitter according to claim 1, further comprising:

an input interface inputting at least one of a video signal and an audio signal from outside,

a modulation circuit modulating said signal input in said input interface to a broadcasting wave receivable in an electronic apparatus having a function of receiving broadcasting, and
a mixing circuit mixing an output wave from said modulation circuit with said broadcasting waves input through said connection unit.

7. (Original) The millimeter wave transmitter according to claim 1, further comprising:

a receiver for receiving a remote control signal from an electronic apparatus having a function of receiving broadcasting.

8. (Previously Presented) A millimeter wave transmitter for performing millimeter wave radio transmission indoors, comprising:

a broadcasting wave input circuit receiving a plurality of broadcasting waves and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;

a broadcasting wave modulation circuit up-converting said broadcasting signals to millimeter waves to be transmitted/received indoors;

a millimeter wave transmission circuit transmitting said millimeter waves; and

a receiving circuit receiving an external control signal and controlling a power supply to supply power to an antenna.

9. (Original) The millimeter wave transmitter according to claim 8, further comprising:

a connection unit connectable with an antenna receiving said plurality of broadcasting waves, and

a power supply circuit supplying driving power to said antenna through said connection unit, wherein

said broadcasting wave input circuit receives said plurality of broadcasting waves through said connection unit, and

said power supply circuit operates on the basis of said external control signal.

10. (Original) The millimeter wave transmitter according to claim 8, further comprising:

a power control circuit controlling execution/interruption of power supply to a plurality of circuits included in said millimeter wave transmitter.

11. (Original) The millimeter wave transmitter according to claim 10, further comprising:

a utilized apparatus storage circuit storing identification information input from said receiving circuit, wherein

said identification information indicates identification information of an electronic apparatus utilizing output signals from said millimeter wave transmitter, and

said power control circuit operates on the basis of said identification information.

12. (Previously Presented) A millimeter wave receiver for performing millimeter wave radio transmission indoors, comprising:

a millimeter wave receiving circuit receiving millimeter waves, obtained by up-converting a plurality of broadcasting waves, to be transmitted/received indoors;

a broadcasting wave demodulation circuit down-converting said millimeter waves to the frequency band of said broadcasting waves;

a connection unit connectable with a connector provided on an electronic apparatus having a function of receiving broadcasting; and

a power receptor circuit receiving driving power of said millimeter wave receiver through said connection unit in superposition with said broadcasting waves.

13. (Original) The millimeter wave receiver according to claim 12, wherein said millimeter waves are radio waves of the 60 GHz band.

14. (Original) The millimeter wave receiver according to claim 12, wherein said broadcasting waves include at least one of radio waves of the radio frequency band of terrestrial waves and radio waves of an intermediate frequency band of satellite broadcasting.

15. (Original) The millimeter wave receiver according to claim 12, further comprising:

an input connector connected with an external antenna receiving said plurality of broadcasting waves, and

a mixing/switching circuit outputting one of said broadcasting waves received by said input connector, output signals from said demodulation circuit, and signals obtained by mixing said broadcasting waves and said output signals.

16. (Previously Presented) The millimeter wave receiver according to claim 12, further comprising:

an inverse frequency arranging circuit changing the frequency arrangement of output signals from said broadcasting wave demodulation circuit.

17. (Original) The millimeter wave receiver according to claim 12, further comprising:

a video/audio signal processing circuit producing at least one of a video signal and an audio signal on the basis of internal information of said millimeter wave receiver,

a modulation circuit modulating said signal produced by said video/audio signal processing circuit to a broadcasting wave receivable in said electronic apparatus, and

a mixing circuit mixing an output wave from said modulation circuit with said broadcasting waves input through said connection unit.

18. (Original) The millimeter wave receiver according to claim 12, further comprising:

a plurality of output terminals, and
a distribution circuit for distributing output signals from said broadcasting wave demodulation circuit to each of said plurality of output terminals.

19. (Original) The millimeter wave receiver according to claim 12, wherein said connection unit is capable of at least one of rotation and bending when connected with said connector, and

said millimeter wave receiving circuit includes at least one millimeter wave antenna having a variably settable direction.

20. (Original) The millimeter wave receiver according to claim 19, wherein said connection unit is capable of said rotation when connected with said connector, said millimeter wave receiving circuit includes a millimeter wave antenna arranged substantially in parallel with the axis of said rotation, and

said millimeter wave antenna has a receiving surface rotatable about the axis of said rotation.

21. (Original) The millimeter wave receiver according to claim 20, wherein

said connection unit is capable of said rotation when connected with said connector,
said millimeter wave receiving circuit includes:
a first millimeter wave antenna arranged substantially in parallel with the axis of said
rotation, and
a second millimeter wave antenna arranged substantially perpendicularly to the axis of
said rotation, and
each of said first and second millimeter wave antennas has a receiving surface rotatable
about the axis of said rotation.

22. (Original) The millimeter wave receiver according to claim 19, wherein
said connection unit is capable of said rotation when connected with said connector,
said millimeter wave receiving circuit includes a millimeter wave antenna obliquely
arranged with respect to the axis of said rotation, and
said millimeter wave antenna has a receiving surface rotatable about the axis of said
rotation.

23. (Original) The millimeter wave receiver according to claim 19, wherein
said connection unit is capable of said rotation on a first axis of rotation when connected
with said connector,
said millimeter wave receiving circuit includes a millimeter wave antenna having a
second axis of rotation in a direction substantially perpendicular to said first axis of rotation, and

said millimeter wave antenna has a receiving surface rotatable about said second axis of rotation.

24. (Original) The millimeter wave receiver according to claim 19, further comprising:

a receiving level detection circuit determining the receiving level in said millimeter wave receiving circuit and outputting a signal responsive to the result of determination,

a video/audio signal processing circuit producing at least one of a video signal and an audio signal as information signal for indicating a receiving state to said electronic apparatus,

a modulation circuit modulating said signal produced by said video/audio signal processing circuit to a broadcasting wave receivable in said electronic apparatus, and

a mixing circuit mixing said broadcasting wave output from said modulation circuit and said broadcasting waves input through said connection unit, wherein

said video/audio signal processing circuit changes said information signal in response to said output of said receiving level detection circuit.

25. (Original) The millimeter wave receiver according to claim 24, further comprising:

a display unit capable of making display responsive to said output of said receiving level detection circuit, and

said display unit executes said display also when said millimeter wave receiver is disconnected from said connector.

26. (Original) The millimeter wave receiver according to claim 12, further comprising:

a control signal receiving circuit receiving a control signal from said electronic apparatus through said connection unit.

27. (Original) The millimeter wave receiver according to claim 26, further comprising:

a transmission circuit transmitting a control signal for controlling a millimeter wave transmitter outputting said millimeter waves.

28. (Original) The millimeter wave receiver according to claim 27, wherein said transmission circuit transmits the control signal received from said electronic apparatus to said millimeter wave transmitter.

29. (Original) The millimeter wave receiver according to claim 26, further comprising:

a power control circuit controlling execution/interruption of power supply to a plurality of circuits included in said millimeter wave receiver, wherein

said power control circuit interrupts power supply to said plurality of circuits included in said millimeter wave receiver when said control signal receiving circuit receives a receiving interruption signal from said electronic apparatus.

30. (Original) The millimeter wave receiver according to claim 12, further comprising:

a receiving circuit receiving an external control signal.

31. (Original) The millimeter wave receiver according to claim 30, wherein said millimeter waves are output from a millimeter wave transmitter, the millimeter wave receiver further comprising a transmission circuit transmitting a control signal for controlling said millimeter wave transmitter.

32. (Original) The millimeter wave receiver according to claim 30, further comprising:

a power control circuit controlling execution/interruption of power supply to a plurality of circuits included in said millimeter wave receiver, wherein said power control circuit interrupts power supply to said plurality of circuits included in said millimeter wave receiver when said receiving circuit receives a receiving interruption signal from said electronic apparatus.

33. (Original) The millimeter wave receiver according to claim 12, wherein said millimeter wave receiving circuit includes a non directional antenna for receiving millimeter waves.

34. (Original) The millimeter wave receiver according to claim 33, further comprising:

a control signal receiving circuit receiving a control signal from said electronic apparatus through said connection unit.

35. (Original) The millimeter wave receiver according to claim 34, further comprising:

a transmission circuit transmitting a control signal for controlling a millimeter wave transmitter outputting said millimeter waves.

36. (Original) The millimeter wave receiver according to claim 34, further comprising:

a power control circuit controlling execution/interruption of power supply to a plurality of circuits included in said millimeter wave receiver, wherein said power control circuit interrupts power supply to said plurality of circuits included in said millimeter wave receiver when said receiving circuit receives a receiving interruption signal from said electronic apparatus.

37. (Original) An electronic apparatus capable of utilizing an output signal from a millimeter wave receiver, comprising:

a connector connected with said millimeter wave receiver;
a memory circuit storing information as to whether or not to utilize said output signal from said millimeter wave receiver in correspondence to a channel subjected to selection for receiving; and

a power supply circuit supplying driving power of said millimeter wave receiver through said connector, wherein

said power supply circuit supplies said driving power through said connector when a channel utilizing said output signal from said millimeter wave receiver is selected on the basis of said information stored in said memory circuit.

38. (Cancelled)

39. (Cancelled)

40. (Previously Presented) An electronic apparatus having a function of receiving television broadcasting including terrestrial waves, comprising:

a millimeter wave receiving circuit receiving millimeter waves, obtained by up-converting a plurality of broadcasting waves, output from a millimeter wave transmitter;

a broadcasting wave demodulation circuit down-converting said millimeter waves to the frequency band of said broadcasting waves;

an inverse frequency arranger receiving output signals of said broadcasting wave demodulation circuit and changing the frequency arrangement of the output signals of said broadcasting wave demodulation circuit; and

a transmission circuit transmitting a control signal for controlling said millimeter wave transmitter.

41. (Previously Presented) A repeater connected to an antenna receiving broadcasting for making a relay to a terminal, comprising:

a broadcasting wave input circuit receiving a plurality of broadcasting waves through said antenna and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;

a frequency arranging circuit receiving said broadcasting signals output from said broadcasting wave input circuit, and changing the frequency arrangement of said broadcasting signals by adjusting the frequency of at least one of said plurality of broadcast signals relative to at least one other of said plurality of broadcast signals;

a power supply circuit supplying power to said antenna;

a connection unit for connection with said terminal; and

a power receptor circuit receiving driving power of said repeater through said connection unit.

42. (Original) The repeater according to claim 41, further comprising: a control signal receiver receiving a control signal from said terminal through said connection unit.

43. (Original) A millimeter wave communication system for performing millimeter wave radio transmission indoors, comprising:

a millimeter wave transmitter for transmitting millimeter wave signals in said millimeter wave radio transmission, said millimeter wave transmitter including:

a first connection unit connectable with an antenna receiving a plurality of broadcasting waves,

a power supply circuit supplying driving power to said antenna through said first connection unit,

a broadcasting wave input circuit receiving said plurality of broadcasting waves through said first connection unit and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively,

a broadcasting wave modulation circuit up-converting said broadcasting signals to said millimeter wave signals to be transmitted/received indoors, and

a millimeter wave transmission circuit transmitting said millimeter wave signals; and

a millimeter wave receiver receiving said millimeter wave signals in said millimeter wave radio transmission, said millimeter wave receiver including:

a millimeter wave receiving circuit receiving said millimeter wave signals,

a broadcasting wave demodulation circuit down-converting said millimeter wave signals to the frequency band of said broadcasting waves,

a second connection unit connectable with a connector provided on an electronic apparatus having a function of receiving broadcasting waves, and

a power receptor circuit receiving driving power of said millimeter wave receiver through said second connection unit.

44. (Original) A millimeter wave communication system for performing millimeter wave radio transmission indoors, comprising:

a repeater connected to an antenna receiving broadcasting for relaying a plurality of broadcasting waves, said repeater including:

a broadcasting wave input circuit receiving said plurality of broadcasting waves through said antenna and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively,

a frequency arranging circuit changing the frequency arrangement of said broadcasting signals,

a first power supply circuit supplying driving power to said antenna, and

a first connection unit connectable with an external apparatus;

a first power receptor circuit receiving driving power of said repeater through said first connection unit;

a millimeter wave transmitter for receiving output signals of said repeater and transmitting millimeter wave signals in said millimeter wave radio transmission, said millimeter wave transmitter including:

a second connection unit connected with said first connection unit,

a second power supply circuit supplying driving power to said repeater through said first and second connection units,

a broadcasting wave modulation circuit receiving said broadcasting signals through said first and second connection units and up-converting said broadcasting signals to millimeter wave signals to be transmitted/received indoors, and

a millimeter wave transmission circuit transmitting said millimeter wave signals; and

a millimeter wave receiver for receiving said millimeter wave signals in said millimeter wave radio transmission, said millimeter wave receiver including:

a millimeter wave receiving circuit receiving said millimeter wave signals,

a broadcasting wave demodulation circuit down converting said millimeter wave signals to the frequency band of said broadcasting waves,

a third connection unit connectable with a connector provided in an electronic apparatus having a function of receiving broadcasting waves, and

a second power receptor circuit receiving driving power of said millimeter wave receiver through said third connection unit.

45. (Original) The millimeter wave communication system according to claim 44, wherein

said millimeter wave transmitter further includes a control signal transmission circuit transmitting a control signal through said second connection unit.

46. (Previously Presented) A millimeter wave transmitter for performing millimeter wave radio transmission indoors, comprising:

a connection unit connectable with an antenna receiving a plurality of broadcasting waves;

a power supply circuit supplying driving power to said antenna through said connection unit;

a broadcasting wave input circuit receiving said plurality of broadcasting waves through said connection unit and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;

a broadcasting wave modulation circuit up-converting said broadcasting signals to millimeter waves to be transmitted/received indoors;

a millimeter wave transmission circuit transmitting said millimeter waves; wherein said millimeter wave transmitter is set indoors and is used in a system including a movable electronic apparatus mounted with a millimeter wave receiver for receiving said millimeter waves transmitted from said millimeter wave transmission circuit; and

said movable electronic apparatus has a function of TV.

47. (Previously Presented) A millimeter wave transmitter for performing millimeter wave radio transmission indoors, comprising:

a connection unit connectable with an antenna receiving a plurality of broadcasting waves;

a power supply circuit supplying driving power to said antenna through said connection unit;

a broadcasting wave input circuit receiving said plurality of broadcasting waves through said connection unit and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;

a broadcasting wave modulation circuit up-converting said broadcasting signals to millimeter waves to be transmitted/received indoors;

a millimeter wave transmission circuit transmitting said millimeter waves; wherein said millimeter wave transmitter is set indoors in the vicinity of a ceiling and is used in a system including a movable electronic apparatus mounted with a millimeter wave receiver for receiving said millimeter waves transmitted from said millimeter wave transmission circuit; and said movable electronic apparatus has a function of TV.

48. (Previously Presented) A millimeter wave transmitter for performing millimeter wave radio transmission indoors, comprising:

a connection unit connectable with an antenna receiving a plurality of broadcasting waves;

a power supply circuit supplying driving power to said antenna through said connection unit;

a broadcasting wave input circuit receiving said plurality of broadcasting waves through said connection unit and converting said broadcasting waves to broadcasting signals corresponding to said broadcasting waves respectively;

a broadcasting wave modulation circuit up-converting said broadcasting signals to millimeter waves to be transmitted/received indoors;

a millimeter wave transmission circuit transmitting said millimeter waves; wherein said millimeter wave transmitter is mounted on or stored in a first electronic apparatus and is used in a system including a movable second electronic apparatus mounted with a millimeter wave receiver for receiving said millimeter waves transmitted from said millimeter wave transmission circuit; and

said movable second electronic apparatus has a function of TV.

49. (Previously Presented) The millimeter wave receiver according to claim 48, wherein said first electronic apparatus is a TV receiver.

50. (Previously Presented) The millimeter wave receiver according to claim 12, further comprising:

an inverse frequency arranging circuit changing the frequency arrangement of output signals from said broadcasting wave demodulation circuit so as to convert the broadcasting waves from the intermediate frequency band to the original frequency band of terrestrial waves.

51. (Previously Presented) The electronic apparatus according to claim 40, wherein said inverse frequency arranger converts the terrestrial waves from the intermediate frequency band of the broadcasting waves to the original frequency band of terrestrial waves.

52. (Previously Presented) The millimeter wave transmitter according to claim 1, wherein

the radio frequency band of terrestrial waves being temporarily converted by said frequency arranging circuit is separated from local oscillated waves when up converted in said millimeter wave transmission circuit.